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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,766	10/29/2003	Trevor MacDougall	WEAT/0379	6665
7590 12/13/2005 William P. Patterson, Esq. MOSER, PATTERSON & SHERIDAN, LLP Suite 1500 3040 Post Oak Boulevard Houston, TX 77056			EXAMINER NGUYEN, TU T	
			ART UNIT 2877	PAPER NUMBER
DATE MAILED: 12/13/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,766

Applicant(s)

MACDOUGALL, TREVOR

Examiner

Tu T. Nguyen

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>07/26/2004</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

For this application, the abstract contains more than 150 words.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 5, the phrase "the shift in an attribute between the first optical signal ... reflected signal" is not clear. Does applicant mean "the second optical signal"? It is not clear how "a difference in frequencies between the second optical and

reflected signals” is related to the first signal? The phrase “the reflected signals” in the last line is not clear. It is not clear which reflected signals applicant want to refer to “the first” or “the second”?

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakairi et al (“A system for measuring temperature and strain separately by BOTDR and OTDR”, SPIE Vol. 4920 (2002)) in view of Yamate et al (2003/0234921).

With respect to claim 1, Sakairi discloses a method for measuring reflected signals. The method comprises: producing a first optical signal having a predefined wavelength range (OTDR, table 1, page 277); coupling the first optical signal to an optical cable (optical fiber sensor, fig 2); receiving a first reflected signal (OTDR) from the sensor within the optical cable; resolving an attribute of the first reflected signal indicative of an environmental condition at the sensor (measuring temperature, abstract); producing a second optical signal at a predefined wavelength (BOTDR, table 1, page 277); coupling the second optical signal to the optical cable (Optical fiber sensor, fig 2); receiving a second reflected signal caused by Brillouin backscattering within the optical cable (BOTDR, abstract); and resolving a shift in attribute between the

second optical signal and second reflected signal that is indicative of an environmental condition along the optical cable (measuring temperature by frequency shift, abstract).

Sakairi does not explicitly disclose a Bragg grating as claimed. Yamate discloses an OTDR apparatus for measuring temperature. The system comprises: a Bragg grating sensor 40 (fig 2). It would have been obvious to modify Sakairi with the Bragg grating sensor taught by Yamate to facilitate the measuring.

With respect to claim 2, Sakairi does not explicitly disclose using a frequency detector for detecting the reflected signals. Since Sakairi discloses a BOTDR for measuring a frequency shift of Brillouin scattered light (abstract), it would have been obvious that Sakairi would have to use a frequency detector in order to measure the frequency shift of Brillouin scattered light.

With respect to claims 3,22, Yamate discloses using a tunable laser (paragraph [0043]).

With respect to claim 4, Sakairi does not disclose the claimed Rayleigh filter. However, Sakairi discloses that the scattering signals having three main types of scattering – Rayleigh, Brillouin and Raman scatterings (page 275). Since Sakairi using BOTDR for measuring the Brillouin scattered light, the skill artisan would have been motivated to modify Sakairi with the claimed Rayleigh filter to filter out the unwanted Rayleigh scattered light to reduce the system noise.

With respect to claims 5-8, since the general conditions of the invention were disclosed by the prior arts, modify the prior arts by measuring a difference in frequencies between the second optical and the reflected signals or determining a reflection spectrum of the Bragg grating sensor or generating the signal at different range of wavelength or pulsing the second optical signal for using the system in different environments would involve only routine skill in the art.

With respect to claim 9, Sakairi does not explicitly disclose the claimed switch. However, the optical channel selector (fig 2) taught by Sakairi would perform the same function as the claimed switch.

With respect to claims 10,19,23,26, it would have been obvious to modify Yamate's Bragg grating sensor comprising a large diameter optical waveguide as claimed to make the system more accurate.

With respect to claims 11,20,24,27, Yamate discloses a Bragg grating sensor comprising an optical fiber 36 (fig 2).

With respect to claim 12, refer to discussion in claim 1 above for the Bragg grating and claim 9 for the optical switch.

With respect to claim 13, refer to discussion in claim 2 above for the frequency detector. Further, the claimed wavemeter would have been known. It would have been obvious to modify Sakairi with the known wavemeter for different intended uses.

With respect to claims 14-15, the skill artisan would have been motivated to modify Sakairi with the claimed signal conditioner or a convolution circuit or the Rayleigh filter to make the system more accurate.

With respect to claims 16,18, Yamate discloses using a tunable light source (paragraph [0043]). Since Yamate discloses using pulse signals As, S (fig 1), it would have been obvious that Yamate would have to have a pulse module as claimed in order to create the pulse signals.

With respect to claim 17, Yamate discloses all the claimed limitation in fig 2.

With respect to claims 21,25, refer to discussion in claim 1 above for the Bragg grating sensor, claim 3 for the tunable light source, claim 9 for the switch, claim 14 for the detectors and claim 4 for the filter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu T. Nguyen whose telephone number is (571) 272-2424. The examiner can normally be reached on T-F 7:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley Jr. can be reached on (571) 272-2800 Ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu T. Nguyen
Primary Examiner
Art Unit 2877

12/07/2005